



# Forest Insect & Disease Management

Survey Report

S-5-75

August 1975

## DUTCH ELM DISEASE SITUATION

### LAKE STATES AND IOWA



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INTRODUCTION Dutch elm disease, caused by the fungus Ceratocystis ulmi (Buisman) C. Moreau, was first described in the Netherlands in 1919 and was introduced into the United States from Europe about 1930. The disease was reported in the Lake States in 1951 and has now spread throughout much of the elm range, causing varying amounts of mortality.

OBJECTIVE The objective of the survey was to determine the current range of Dutch elm disease in the Lake States and Iowa, estimate the remaining elm resource and the mortality that had occurred by 1974.

METHODS The annual spread of Dutch elm disease (DED) throughout the Lake States and Iowa was provided by appropriate departments in each of the four states.

The remaining elm resource data were obtained from the most current Forest Survey report with adjustments made for the estimated mortality that had occurred since the survey.

DED spread data were gathered by Harvey Tokol<sup>1/</sup> from State sources for the Profit Seminar on Elm Resource held at Green Bay, Wisconsin, in 1974.

The future trends are predicted using the date the disease was initially reported in a county and the mortality that had occurred by 1974.

RESULTS AND CONCLUSIONS The disease was first reported in the southern part of Lower Michigan in 1951. By 1958, the range included all counties in the southern half of Lower Michigan, southeastern Wisconsin and three counties in southeastern Iowa. By 1963, the range also included central Lower Michigan, southern one third of Wisconsin, a major portion of Iowa, and the St. Paul, Minnesota area. By 1966, infection was present in all of Lower Michigan, central Upper Michigan, southern Wisconsin, all but five counties of Iowa and up the Mississippi River valley to St. Paul. By 1970, it had spread throughout the southern half of Minnesota and

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<sup>1/</sup> Forest Insect and Disease Management, S&PF, Washington, D.C.



was sporadic in northern Minnesota. The complete range and dates of spread by county (1951-1974) are depicted in Figure 1.

Current estimates indicate there are approximately 0.6 billion bd ft of elm sawlog material in Michigan, 1.6 billion in Wisconsin, 1.3 billion in Minnesota and 1.0 billion in Iowa (Figure 2).

Approximately 32 percent of the total elm resource has been lost; mortality ranging from 98 percent in Lower Michigan to none in parts of northern Minnesota. The losses by county are shown in Figure 3.

The future for elm in the Lake States is not as bleak as it first seems. Much of the infected elm range is in the southern part of the Lake States and Iowa, along river bottoms where the disease spreads rapidly. In contrast, much of the remaining elm is scattered on upland hardwood sites; less root grafting is possible, and the fungus may not move as rapidly as in the south. Also, one vector, the smaller European elm bark beetle (which may be more effective in the transmission of the disease from tree to tree than the native elm bark beetle), appears to be limited primarily to the southern three fourths of Wisconsin and the southern half of Minnesota and lower Michigan. Its absence in other areas could affect the rate of spread.

Analysis of the date of reported initial infection versus total mortality reveals a general trend of more than 80 percent mortality of elm after 20 years, 60 to 41 percent mortality after 15 years, 40 to 11 percent mortality after 10 years and up to 10 percent mortality during the first 5 years. Exceptions to these generalizations can be attributed to a lag in the reporting date to the actual infection date, the variation in size of the survey unit, which is by county and currency of survey. The trend information is speculative because of the lack of adequate information on mortality and a precise infection date.



# LEGEND

-  1951 - 1954
-  1955 - 1958
-  1959 - 1962
-  1963 - 1966
-  1967 - 1970
-  1971 - 1974

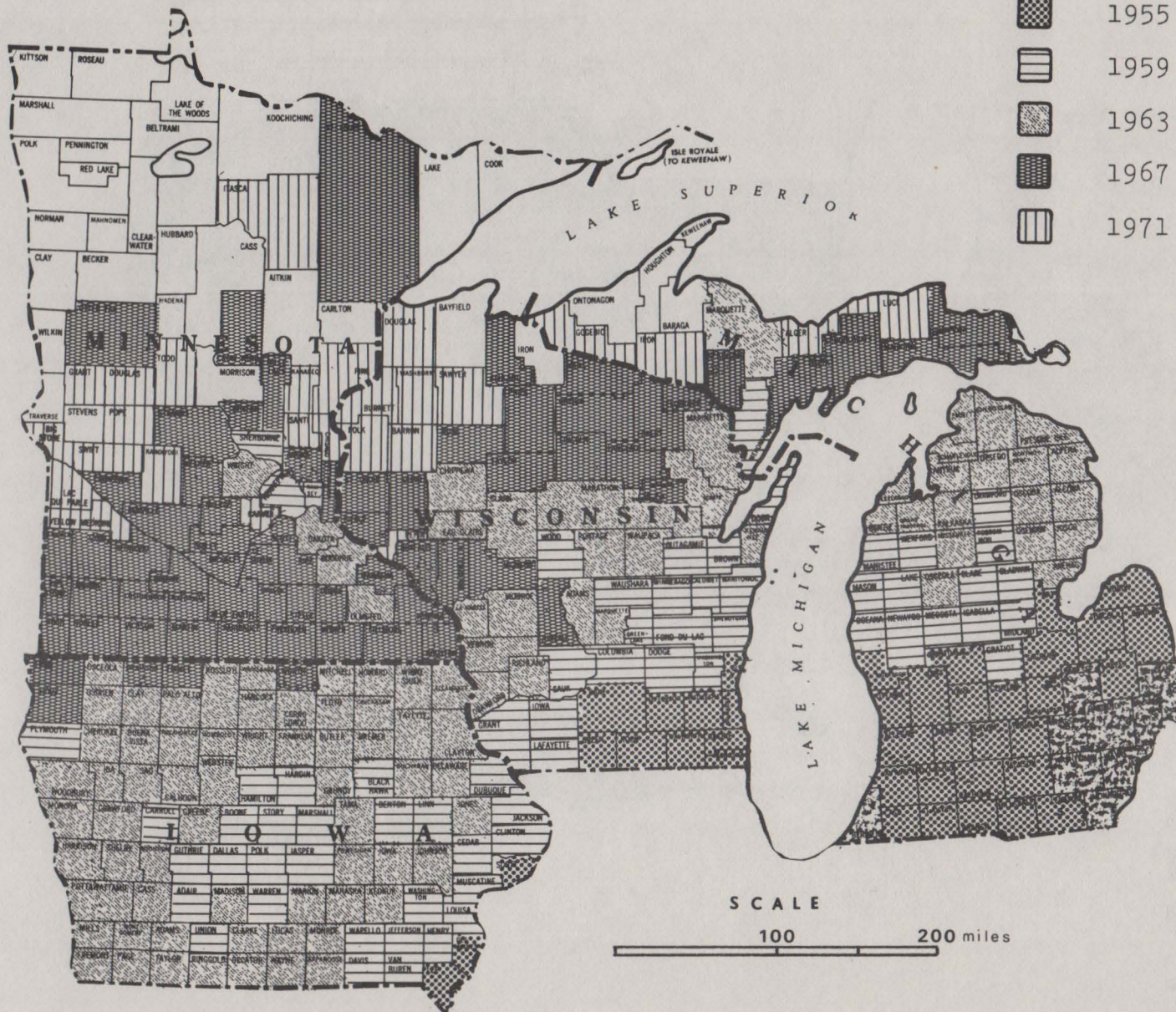


Figure 1. Dutch Elm Disease Spread by Year .



# LEGEND

Million Bd. Ft. / County

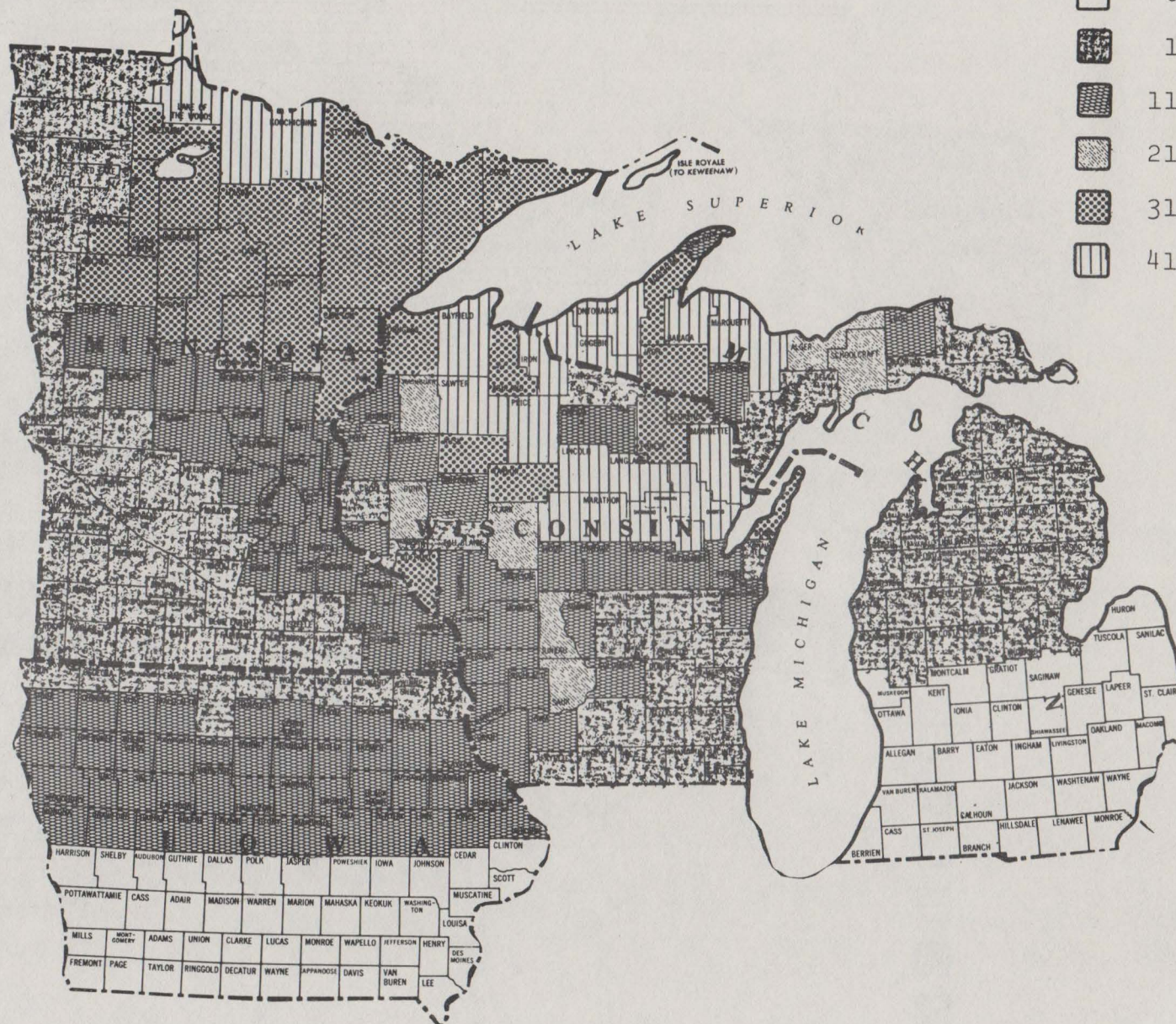
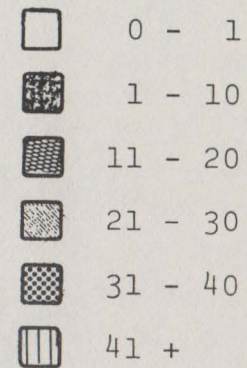


Figure 2. Current Estimates of Elm Volumes the Lake States and Iowa, 1974.



# LEGEND

Percent

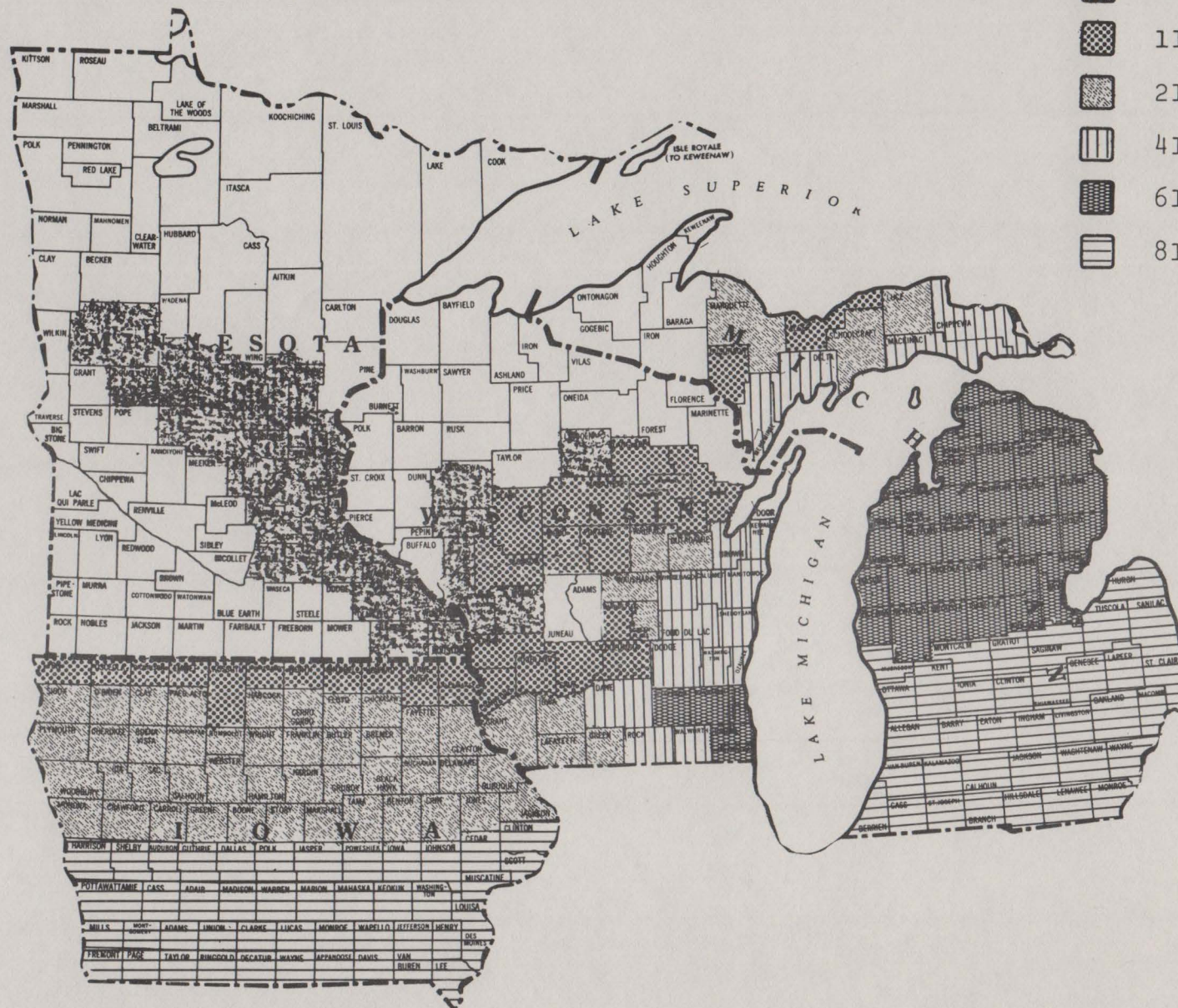
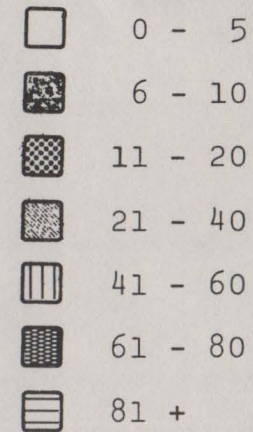


Figure 3. Mortality Estimates by Counties in the Lake States and Iowa, 1974.